

CHEQUAMEGON BAY ASSESSMENTS, 2004

INTRODUCTION

The various fisheries of Chequamegon Bay are an important component of the sport fishery in Lake Superior. The “Bay” receives substantial fishing pressure during the open water and ice fishing seasons. Chequamegon Bay has a unique assemblage of fishes, which provides abundant fishing opportunities but also complicates management strategies. Monitoring the diverse fisheries of the “Bay” must be accomplished through a variety of assessments. The objective of this report is to briefly present data from the various assessments that are conducted within Chequamegon Bay.

METHODS

1) From May 27th to June 24th, 400 ft and 800 ft graded mesh monofilament gill net gangs (100 ft or 200 ft panels of 8,10,12,14 in meshes) were set along the Ashland shoreline near the breakwall and near Washburn to capture lake sturgeon (Figure 1). Lake sturgeon were measured (total length), implanted with passive integrated transponder (PIT) tags, marked with external t-bar tags, and weighed when conditions permitted.

2) Smallmouth bass were sampled on June 15-16, in the Kakagon and Sand Cut Sloughs (Figure 1). Wisconsin Department of Natural Resources (WDNR) personnel sampled areas with high concentrations of smallmouth bass preparing to spawn. Smallmouth bass were measured (total length) and scales and dorsal spines were collected for age estimation. During several past surveys smallmouth bass also were marked with individually numbered t-bar tags.

3) On September 2-3, 17 index stations from Sand Cut Slough to Boyd Creek were seined to catalog forage species and young-of-the-year smallmouth bass (Figure 1). Stations were sampled with a 50 ft bag seine (3/16 in mesh, 4 ft by 4ft bag) dragged along a standard distance of shoreline. Species counts were done and a subsample of each species was measured (total length).

4) Gill nets were set for one-hour intervals along the Ashland shoreline on October 6-11 and November 2. Three monofilament gill nets were set for 25 hours: 12 hours with 3600 ft of 5.25 in mesh, four hours with 1200 ft of 5.0 in mesh, and nine hours with 2700 ft of graded mesh (1.5, 2, 2.5, 3, 4.5, 5). Fish were measured (total length) and, marked with individually numbered t-bar tags and aging structures were collected when conditions permitted.

RESULTS/DISCUSSION

1) In 2004, 75 lake sturgeon were captured, which averaged 43.9 in (min = 23.6, max = 68.8) (Table 1). Catch-per-unit-effort of lake sturgeon from the 8 and 10 in meshes increased from 1988 to 2004 (Figure 2). Five lake sturgeon had been tagged previously by WIDNR personnel. One lake sturgeon (57.7 in male) captured in 2004 had been captured twice before in the Sturgeon River, Upper Peninsula, MI while spawning and once before in Chequamegon Bay. In addition, lake sturgeon previously tagged in the Bad River have been recaptured in Chequamegon Bay. Although lake sturgeon do not spawn in the “Bay”, they may spend the non-spawning years feeding in the “Bay”.

2) During spring sampling, 110 smallmouth bass were captured in the Sand Cut and Kakagon sloughs (Figure 3). Mean length of smallmouth bass was 17.3 in (SD = 1.8). Mean length of smallmouth bass has increased steadily since 1991 (Figure 4). Mean length-at-age has not changed noticeably since 1991 (Table 2). The number of age classes represented in the catch has increased over the past decade (Table 3). The 22 in minimum length limit has increased the number of larger smallmouth bass and allowed more year-classes to contribute to the fishery.

3) Nineteen species were captured during seining in 2004 (Table 4). Smallmouth bass per seine haul was relatively stable but yellow perch per haul has been much more variable since 1996 (Figure 5). Annual changes in vegetation and woody structure in several of the sites in Chequamegon Bay are likely influencing forage catchability, thus influencing the composition and size of the catches. Alternative methods of quantifying forage abundance will likely be investigated in the future.

4) In 2004, 180 smallmouth bass were tagged in fall sampling (Figure 6). Mean length of smallmouth bass was 17.1 in (SD = 1.3). Thirty-seven walleye were captured, which had a mean length of 21.9 in (SD = 2.8). Twelve whitefish were captured, which had a mean length of 19.7 (SD = 4.9).

Since 1993, 1747 smallmouth bass have been tagged in Chequamegon Bay during various assessments. Through 2004, 158 tagged fish had been recaptured on at least one occasion. Recapture data has revealed a relatively consistent seasonal migration pattern. Spring recaptures indicate that almost all smallmouth bass reproduction occurs in the eastern sloughs. For example, all but two smallmouth bass recaptures during May and June have been in Kakagon and Sand Cut Sloughs. During summer most bass move out of the sloughs into deeper water and in fall many bass congregate off the Ashland shoreline. Furthermore, anglers consistently catch smallmouth bass during winter months near Ashland.

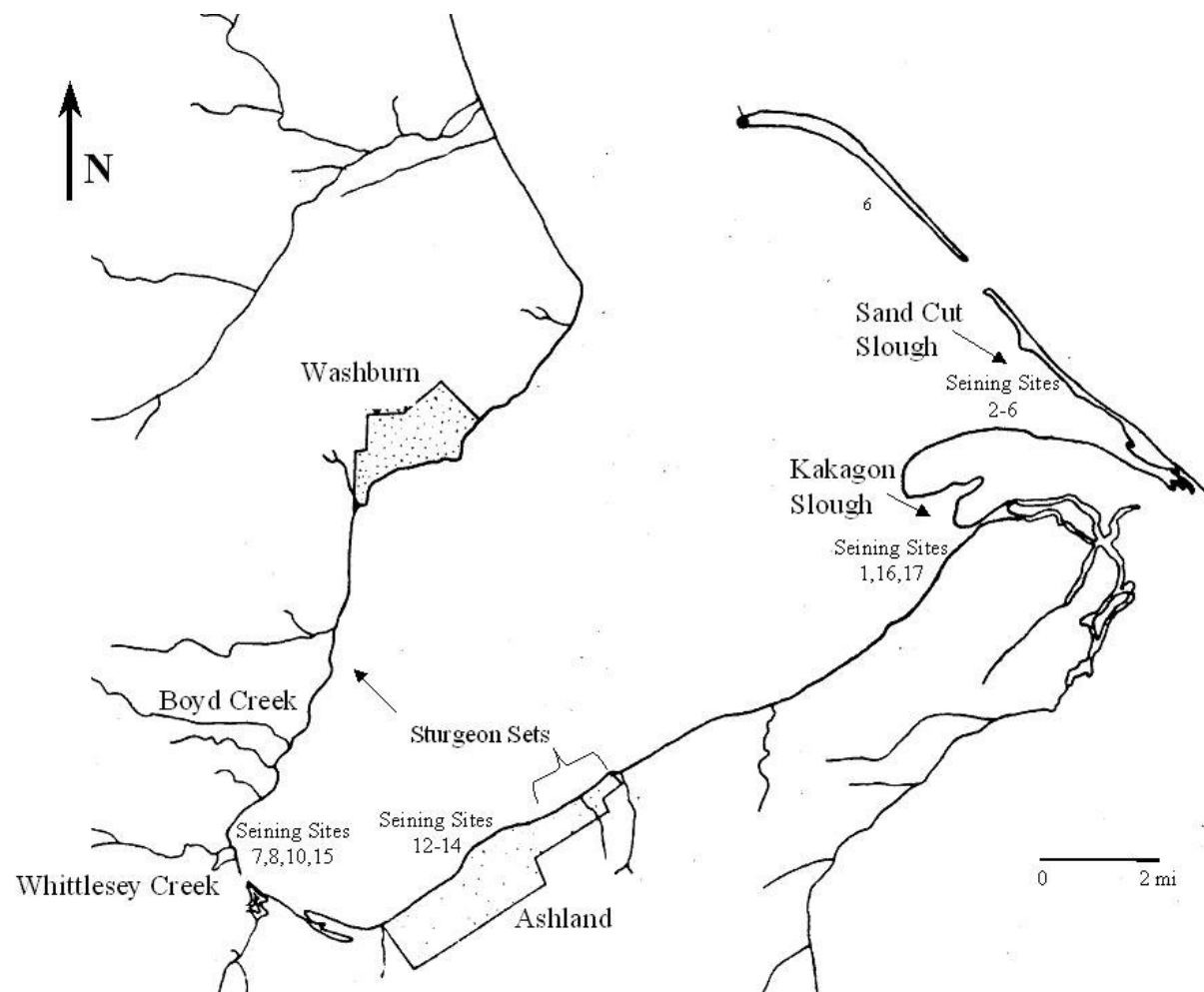


Figure 1. Map of Chequamegon Bay, Lake Superior with seining stations and lake sturgeon gill net sets.

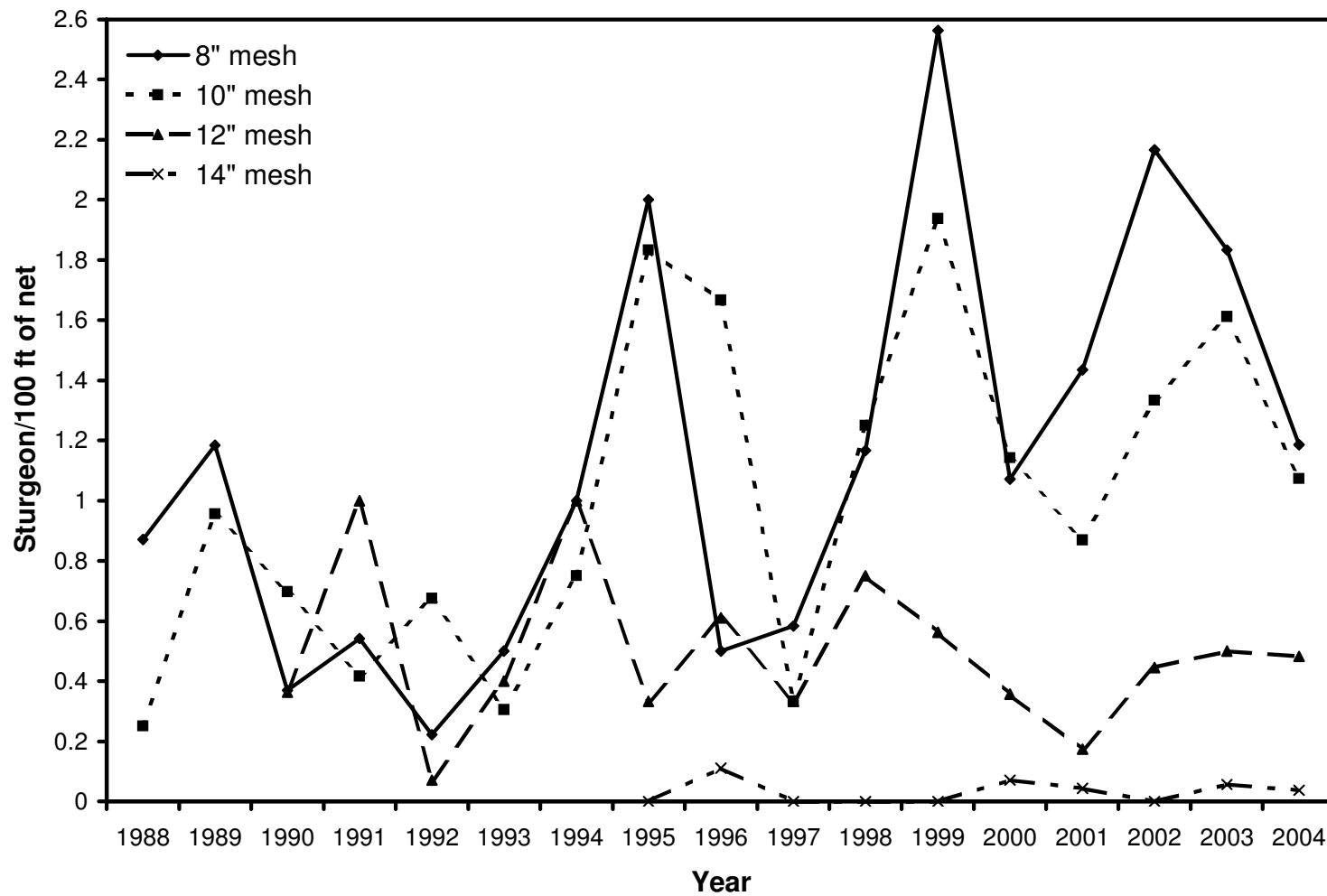


Figure 2. Catch-per-unit-effort of lake sturgeon from spring Chequamegon Bay assessment, 1988-2004. Twelve in mesh was added to the assessment in 1990 and 14 in mesh was added in 1995.

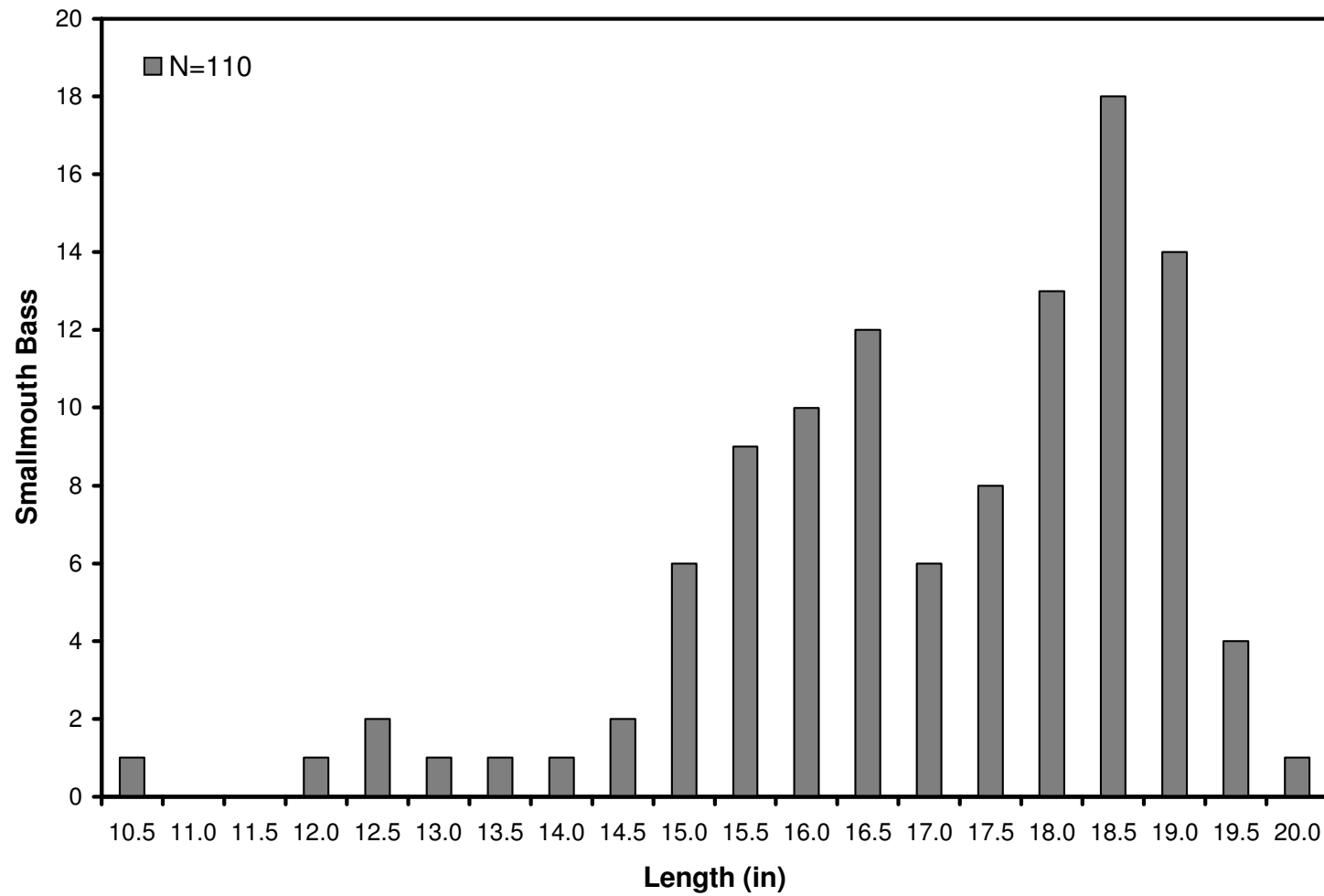


Figure 3. Length frequency of smallmouth bass captured during spring assessment in Chequamegon Bay, 2004.

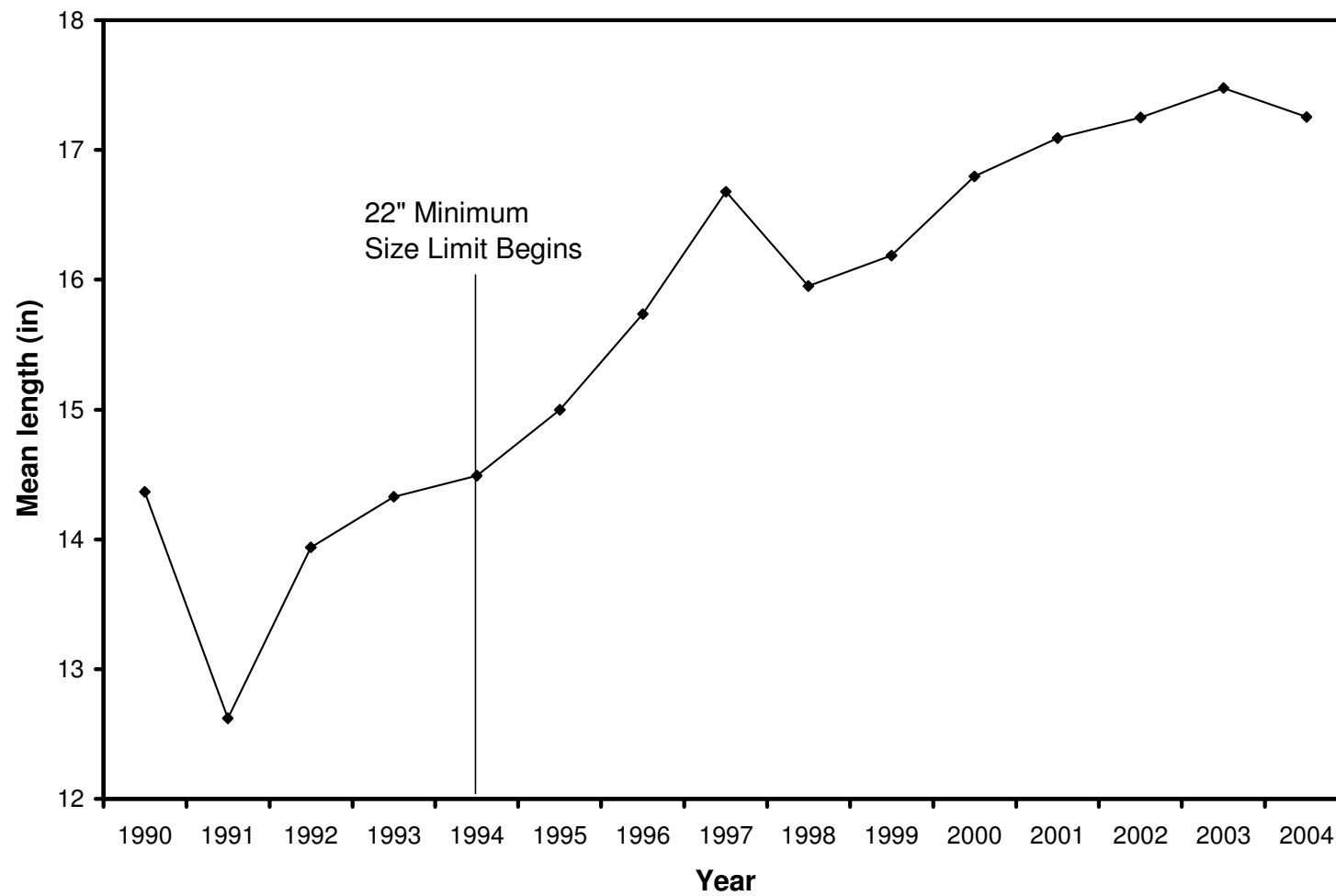


Figure 4. Mean length of smallmouth bass (in) from spring assessment in Chequamegon Bay, 1990-2004.

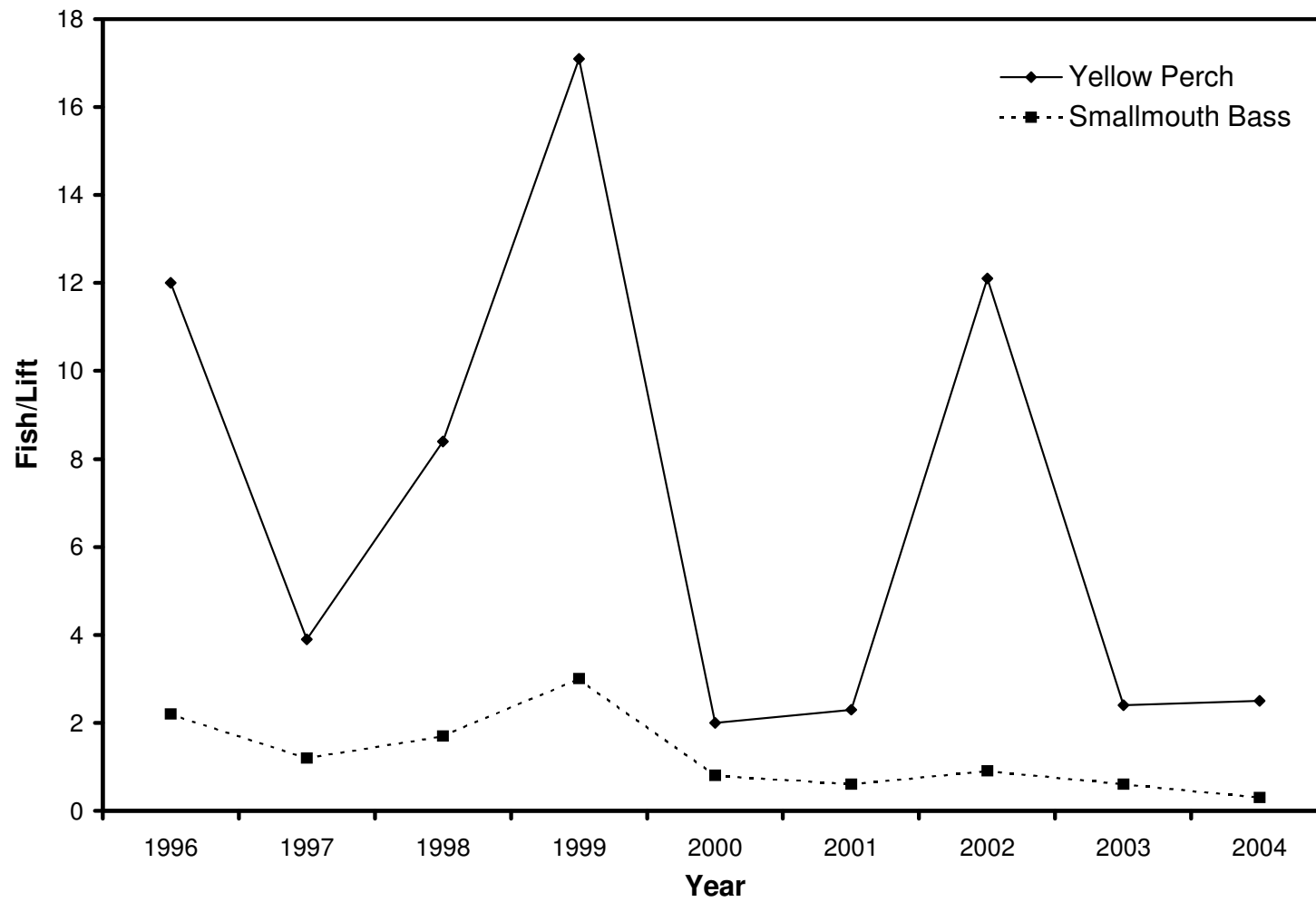


Figure 5. Smallmouth bass and yellow perch per seine haul in Chequamegon Bay, 1996-2004.

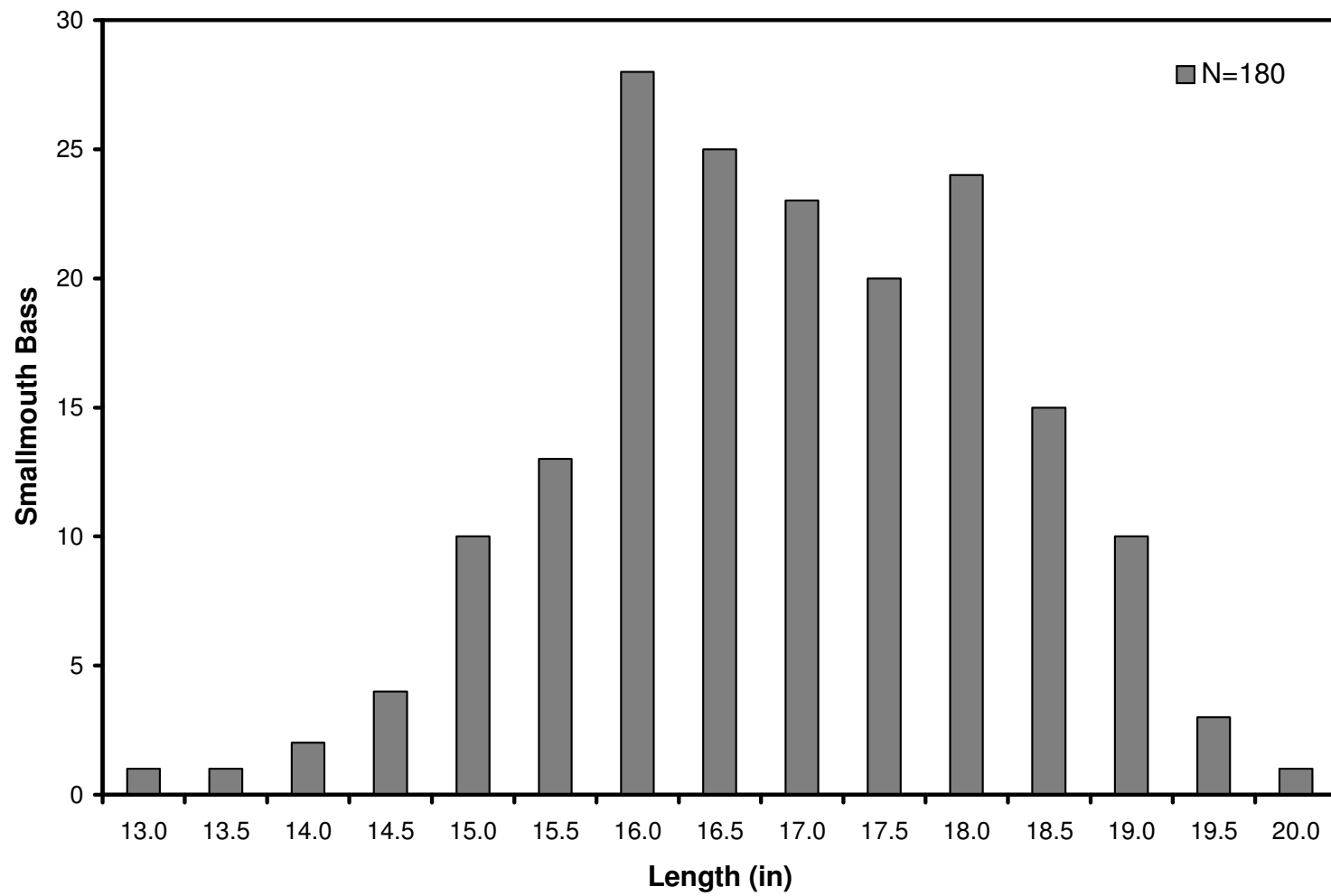


Figure 6. Length frequency of smallmouth bass captured in fall assessment in Chequamegon Bay, 2004.

Table 1. Lake sturgeon catch and effort data from Chequamegon Bay assessment, 1995-2004.

YEAR	EFFORT	DAYS	NUMBER OF STURGEON						# OF DNR RECAPS	LENGTH (IN)			WEIGHT (LBS)		
			TOTAL	8"	10"	12"	14"	CPE/100'		MIN.	MAX	AVE	MIN.	MAX	AVE
2004	10800	9	75	32	29	13	1	0.69	5	23.6	68.8	43.9	2	52	22.4
2003	7200	6	72	33	29	9	1	1.00	3	26.2	67.1	43.7	4.5	71.0	22.9
2002	7200	6	71	39	24	8	0	0.99	7	23.6	67.0	43.2	3.0	100+	22.5
2001	9200	9	58	33	20	4	1	0.63	2	31.0	60.0	45.5	7.0	53.0	25.2
2000	5600	5	37	15	16	5	1	0.66	3	24.0	64.6	45.3	3.5	58.0	23.9
1999	6400	8	81	41	31	9	0	1.27	2	24.0	62.4	42.5	3.0	70.0	20.7
1998	4800	7	38	14	15	9	0	0.79	5	31.5	57.9	45.0	14.0	52.0	26.9
1997	4800	5	15	7	4	4	0	0.31	1	24.8	59.2	47.3	5.0	56.0	27.1
1996	7200	7	52	9	30	11	2	0.72	5	32.2	60.0	47.7	8.0	61.0	27.4
1995	2400	3	25	12	11	2	0	1.04	2	28.8	64.0	41.6	4.5	55.0	18.9
1994	2400	4	21	8	6	8	na	0.87	0	33.2	65.3	48.2	8.5	62.0	31.2
1993	9200	6	37	18	11	8	na	0.40	4	26.7	65.9	47.2	8.0	80.0	29.3
1992	9000	7	36	8	27	1	na	0.40	6	28.0	60.0	45.0	6.0	57.0	23.0
1991	5200	4	27	13	10	4	na	0.52	4	26.2	65.7	43.7	4.5	62.0	23.4
1990	14200	10	74	20	46	8	na	0.52	5	25.2	65.5	48.0	5.5	100+	27.6
1989	4750	3	51	29	22	na	na	1.07	0	27.5	59.0	42.4	6.0	51.0	20.0
1988	5900	6	34	27	7	na	na	0.58	1	34.9	55.9	43.1	na	na	na
TOTAL	115450		804	358	338	103	6		55						

Note: Lake sturgeon were weighed when conditions permitted. Thus the lake sturgeon in length for a particular was not always the largest fish in weight.

Table 2. Mean length-at-age of smallmouth bass from spring assessments in Chequamegon Bay, 1991-2003. No age data were collected in 1993.

[illegible]

Table 3. Proportion of spring catch for smallmouth bass from Chequamegon Bay, 1991-2003. No age data collected in 1993. Highest proportion in bold and border for each year.

Age	Year											
	1991	1992	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
2							4.4					
3	16.0						6.7		7.7	14.9		1.4
4	74.8	17.9	4.6	4.2		3.2	11.1	6.3		9.5	11.1	5.5
5	6.9	49.3	8.3	4.2	4.4	6.5	6.7	18.8	3.8	8.1	3.7	6.8
6	0.8	6.0	31.2	33.3	13.3	3.2			15.4	9.5	7.4	2.7
7	0.8	7.5	49.5	27.1	15.6	12.9	8.9	6.3	7.7	20.3	1.9	15.1
8		9.0	1.8	27.1	34.4	9.7	8.9	6.3	3.8	5.4		2.7
9	0.8	6.0	0.9	4.2	25.6	54.8	13.3		11.5	2.7	5.6	2.7
10		1.5	3.7		4.4	9.7	26.7	18.8	11.5	2.7	9.3	9.6
11		1.5			2.2		17.8	12.5	26.9	5.4	16.7	12.3
12								31.3	7.7	2.7	14.8	21.9
13									3.8	6.8	9.3	6.8
14										12.2	9.3	5.5
15		1.5									11.1	6.8
16												2.7
Year Classes	6	9	7	6	7	7	9	7	10	12	11	14

Table 4. Catch data from summer seining stations in Chequamegon Bay, 2004.

Station	YEP	SMB	Eme. Shiner	Mimic Shiner	John Dart.	Rock Bass	Spot. Shiner	Comm. Shiner	Slim. Scul.	White Sucker	Log- perch	Pumpin- seed	Fat. Minn.	Ruffe	Blue- gill	Blackch. Shiner	LMB	Gold. Shin.	Sand Shiner
1	5													1					
2	2			12							1								
3																			
4	1																		
5																			
6																			
7					2											1			
8			1		7				1										
10	4	2	3		3	3		5		1		1	1			1	1		1
12	3			1			1	10		2			1			1			
13	7			2				12								11		1	
14		1																	
15		1	9			1													
16	5						2											1	
17	11					8									5			1	
Sum	38	4	13	15	12	12	3	27	1	3	1	1	2	1	5	14	1	3	1